

What is claimed is:

1. A component of a plasma processing apparatus, comprising:
a first member bonded to a second member, the first member including a plurality of through apertures having a first portion and a second portion wider than the first portion; and
a plurality of first fastener members each mounted in an aperture of the first member, each first fastener member including a bearing surface facing a surface that at least partially defines the second portion of the aperture.
2. The component of Claim 1, wherein (i) the first fastener members are T-nuts with internal threads, or (ii) the first fastener members comprise a head and an externally threaded end portion opposite the head.
3. The component of Claim 1, wherein the first fastener members each include a head bonded with an elastomer to the surface.
4. The component of Claim 1, further comprising:
a temperature-controlled top plate including a plurality of through openings each aligned with a respective aperture in the first member; and
a plurality of second fastener members each engaged with a respective first fastener member to secure the first member to the top plate.
5. The component of Claim 1, wherein each of the first fastener members comprises a rectangular shaped head.

6. The component of Claim 1, wherein each of the first fastener members includes a head configured to prevent rotation of the first fastener members relative to the first member.

7. The component of Claim 1, wherein the first member comprises a plate made of graphite, and the second member comprises a showerhead electrode made of silicon.

8. The component of Claim 1, wherein the second member comprises an inner silicon electrode and a segmented outer silicon electrode, and the backing member comprises a graphite backing plate secured to the inner silicon electrode and a graphite backing ring secured to the outer silicon electrode.

9. The component of Claim 4, wherein (i) each of the first fastener members comprises internal threads, and each of the second fastener members comprises external threads engaged with the internal threads of a respective first fastener member, or (ii) each of the first fastener members comprises external threads, and each of the second fastener members comprises internal threads engaged with the external threads of a respective first fastener member.

10. A component of a plasma processing apparatus, comprising:
a first part including an attachment surface and an exposed surface adapted to be exposed to an interior of a plasma processing chamber;
a second part including a first surface spaced from a second surface, the first surface being bonded to the attachment surface of the first part, the second part including axially extending apertures extending between the first surface and the second surface, each of the apertures including a first portion opening in the

first surface and a second portion opening in the second surface, the second portion being wider in a transverse direction than the first portion; and fastener members located in the second portions of the apertures.

11. The component of Claim 10, further comprising:
a third part including through openings aligned with the apertures in the second part; and
connectors located in the openings, the connectors being detachably engaged with the fastener members such that the third part is detachable from the second part.

12. The component of Claim 10, wherein the first part is a showerhead electrode, and the second part is a backing plate.

13. The component of Claim 11, wherein the fastener members are T-nuts, and the connectors include external threads.

14. The component of Claim 10, wherein the second portions of apertures comprise at least one load-bearing surface extending in the transverse direction, and the fastener members comprise at least one surface bonded to the load-bearing surface.

15. The component of Claim 10, wherein the fastener members are T-nuts.

16. The component of Claim 11, wherein the first portions of the apertures are round holes having diameters larger than diameters of openings in the third part.

17. A showerhead electrode assembly for a plasma processing apparatus, comprising:

- a silicon electrode having gas injection openings;
- a graphite backing member secured to the silicon electrode, the backing member including a plurality of through apertures each having a first portion and a second portion wider than the first portion;
- a top plate including a plurality of through openings each of which is aligned with a respective aperture in the backing member;
- a plurality of first fastener members, each first fastener member being mounted in a respective aperture of the backing member, the first fastener member including a bearing surface facing a surface at least partially defining the second portion of the apertures; and
- a second fastener member engaged with each first fastener member to secure the backing member to the top plate.

18. The showerhead electrode assembly of Claim 17, wherein the first fastener members each comprise a head adhesively bonded to the bearing surface of the aperture, and/or the first fastener members are T-nuts.

19. The showerhead electrode assembly of Claim 17, wherein the second portion of each aperture is configured to prevent rotation of the first fastener member relative to the backing member.

20. The showerhead electrode assembly of Claim 17, wherein the silicon electrode comprises an inner member and a segmented outer member, and the backing member comprises a backing plate secured to the inner member and a backing ring secured to the outer member.

21. The showerhead electrode assembly of Claim 17, wherein (i) each of the first fastener members comprises internal threads, and each of the second fastener members comprises external threads engaged with the internal threads of a respective first fastener member, or (ii) each of the first fastener members comprises external threads, and each of the second fastener members comprises internal threads engaged with the external threads of a respective first fastener member.

22. A method of making an electrode assembly for a plasma processing apparatus, comprising:

mounting a plurality of first fastener members in a plurality of apertures of a backing member, each aperture including a first portion and a second portion wider than the first portion, each first fastener member including a head disposed in the second portion of an aperture; and

securing the backing member to an electrode;

the head of each of the first fastener members being configured to prevent the first fastener members from being pulled out of the respective apertures in a direction away from the electrode or from rotating.

23. The method of Claim 22, further comprising fastening the backing member to a top plate including a plurality of through openings each of which is aligned with a respective aperture of the backing member, the fastening including

inserting a second fastener member in openings of the top plate such that each second fastener member engages a respective first fastener member to secure the backing member to the top plate.

24. The method of Claim 22, wherein the first fastener members are T-nuts.

25. The method of Claim 22, further comprising, before the mounting, bonding the head of each of the first fastener members to a bearing surface that partially defines the second portion of the aperture.